

Please replace claims 11-20 with the following amended claims.

02  
11. (Amended) An isolated gene encoding an antimicrobial protein which can be obtained from a fraction of an aqueous extract of *Lyophyllum shimeji* precipitated by the ammonium sulfate precipitation method, wherein said protein has an antimicrobial activity at least against *Rhizoctonia solani* or *Pyricularia oryzae*, and shows the presence of components of about 70 kDa and/or about 65 kDa in molecular weight in the SDS-PAGE method; or

wherein said antimicrobial protein has an amino acid sequence of SEQ ID NO:2, or has 50% or more homology with said sequence and has an antimicrobial activity against *Rhizoctonia solani* or *Pyricularia oryzae*; or

wherein said protein comprises a single polypeptide having a partial amino acid sequence of amino acid residues 76 to 618 of SEQ ID NO:2, or a polypeptide having 50% or more homology with said partial amino acid sequence and having an antimicrobial activity against *Rhizoctonia solani* or *Pyricularia oryzae*, or a combination of these polypeptides.

12. (Amended) The isolated gene according to Claim 11, encoding an antimicrobial protein and having a base sequence of SEQ

ID NO:1, or a base sequence which is complementary to a base sequence which hybridizes to SEQ ID NO:1 under stringent conditions of 6 x SSC, 45°C to 68°C (without formamide) or 25°C to 50°C (with 50% formamide).

01  
cont 13. (Amended) The isolated gene according to Claim 11 encoding a protein having antimicrobial activity and having a 50% or more homology with the base sequence of SEQ ID NO:1.

14. (Amended) The isolated gene according to Claim 11 encoding a protein having antimicrobial activity and having a 60% or more homology with the base sequence of SEQ ID NO:1.

15. (Amended) The isolated gene according to Claim 11 encoding a protein having antimicrobial activity and having a 70% or more homology with the base sequence of SEQ ID NO:1.

16. (Amended) The isolated gene according to Claim 11 encoding a protein having antimicrobial activity and having an 80% or more homology with the base sequence of SEQ ID NO:1.

17. (Amended) The isolated gene according to Claim 11 encoding a protein having antimicrobial activity and having a 90% or more homology with the base sequence of SEQ ID NO:1.

18. (Amended) The isolated gene according to Claim 11 encoding a protein having antimicrobial activity and having a 95% or more homology with the base sequence of SEQ ID NO:1.

19. (Amended) An oligonucleotide for obtaining a gene encoding an antimicrobial protein originated from *Lyophyllum shimeji* produced by a process comprising:

selecting two domains from the base sequence of the gene of SEQ ID NO:1 wherein said domains satisfy the following requirements:

- 1) each domain consists of 15 to 30 bases; and
- 2) each domain has 40 to 60% of G+C;

preparing single-stranded DNAs having base sequences which are identical to the base sequences of said domains or complementary thereto, or preparing a single-stranded DNA mixture having degeneracy in the genetic code which ensures that the amino acid residues coded by said single-stranded DNAs are not changed; and optionally modifying the single-stranded DNAs while avoiding

Q1  
Conclude  
damage to the binding specificity to the base sequence of said gene encoding the antimicrobial protein.

20. (Amended) The oligonucleotide according to claim 19 having a nucleotide sequence of any one of SEQ ID NOS:7 to 12.

---

Please add the following new claims 28-32.

---

28. The isolated gene according to claim 11, encoding an antimicrobial protein, wherein said antimicrobial protein has pyranose oxidase activity.

29. An isolated gene encoding an antimicrobial protein and having a base sequence of SEQ ID NO:1, or a base sequence which is complementary to a base sequence which hybridizes to SEQ ID NO:1 under stringent conditions of 6 x SSC, 45°C to 68°C (without formamide) or 25°C to 50°C (with 50% formamide).

Q1/Q3  
30. An isolated gene encoding an antimicrobial protein which can be obtained from a fraction of an aqueous extract of *Lyophyllum shimeji* precipitated by the ammonium sulfate precipitation method, wherein said protein has an antimicrobial activity at least against *Rhizoctonia solani* or *Pyricularia oryzae*, and shows the presence of

components of about 70 kDa and/or about 65 kDa in molecular weight in the SDS-PAGE method.

CS  
AG

31. An isolated gene encoding an antimicrobial protein which can be obtained from a fraction of an aqueous extract of *Lyophyllum shimeji* precipitated by the ammonium sulfate precipitation method, wherein said protein has an antimicrobial activity at least against *Rhizoctonia solani* or *Pyricularia oryzae*, and shows the presence of components of about 70 kDa and/or about 65 kDa in molecular weight in the SDS-PAGE method; and wherein said gene according has a base sequence of SEQ ID NO:1 or a base sequence which is complementary to a base sequence which hybridizes to SEQ ID NO:1 under stringent conditions of 6 x SSC, 45°C to 68°C (without formamide) or 25°C to 50°C (with 50% formamide).

32. An oligonucleotide for obtaining a gene encoding an antimicrobial protein originated from *Lyophyllum shimeji* produced by a process comprising:

selecting two domains from the base sequence of the gene of SEQ ID NO:1, wherein said domains satisfy the following requirements:

- 1) each domain consists of 15 to 30 bases; and
- 2) each domain has 40 to 60% of G+C; and

Application No. 09/856,327

*As concluded* preparing single-stranded DNAs having base sequences which are identical to the base sequences of said domains or complementary thereto, or preparing a single-stranded DNA mixture having degeneracy in the genetic code which ensures that the amino acid residues coded by said single-stranded DNAs are not changed.

---